

REMARKS

A total of 32 claims remain in the present application. The foregoing amendments are presented in response to the Office Action mailed July 13, 2006, wherefore reconsideration of this application is requested.

By way of the above-noted amendments, independent claims 36 and 43 have been amended to more precisely define features of the present invention. Claim 47 has been amended to correct the claim dependency, and thereby ensure proper antecedent support.

In preparing the above-noted amendments, careful attention was paid to ensure that no new subject matter has been introduced.

Referring to the text of the Final Office Action:

- claims 7-8, 10-12, 14, 26-27, 31-39 and 42-48 stand rejected under 35 U.S.C. § 102(e), as being unpatentable over the teaching of United States Patent No. 6,618,395 (Kimmitt);
- claims 7-8, 11, 26-27, 31, 33-35, 38 and 42-45 stand rejected under 35 U.S.C. § 103(a), as being unpatentable over the teaching of United States Patent No. 6,417,958 (Du et al); and
- claims 13, 15, 28-30, 40-41 and 49 are objected to as being dependent on a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As an initial matter, Applicant appreciates Examiner's indication of allowable subject matter in claims 13, 15, 28-30, 40-41 and 49. The Examiner's rejections of claims 7-8, 10-12, 14, 26-27, 31-39 and 42-48 under 35 U.S.C. § 102(e), and claims 7-8, 11, 26-27, 31, 33-35, 38 and 42- under 35 U.S.C. § 103(a) are believed to be traversed by way of the following discussion.

Rejections under 35 U.S.C. § 102(e)

According to Kimmitt, "Each of the channels 34, 36, 38, 40 has a separate side scrambler 44, which is generating the same binary sequence. The sequence generated in

each channel, however, is offset in time, so that channels are de-correlated locally in time.”
(col 10, lines 20-23)

In direct contrast, independent claims 32 and 34, the present invention provides methods and systems in which “each one of a plurality of data signals [are scrambled] using a respective unique scrambling pattern, each scrambling pattern being substantially de-correlated from the other scrambling patterns at any given offset”. The scrambled data signals are then transmitted through respective channels of the WDM optical signal.

Thus it will be seen that Kimmitt teaches directly away from the respective unique scrambling patterns of the present invention. Kimmitt teaches the use of the “same binary sequence” for each channel, while the present invention requires a “respective unique scrambling pattern”. Obviously, if the “same binary sequence” is used for every channel, they cannot possibly be unique. Imposing a temporal offset between each of the channels, as taught by Kimmitt, does not solve this problem.

Furthermore, previous claims 32 and 34, and amended claims 36 and 43, require a limitation wherein each scrambling (or pseudo-random) pattern is substantially de-correlated from the other scrambling patterns at any given offset.” Here again, Kimmitt teaches directly away from the present invention. In particular, Kimmitt teaches that “the sequence generated in each channel is ... offset in time”. Since a time shift is being relied upon to provide decorrelation, it follows that, for any given pair of channels, there is at least one offset in which at the respective sequences will be exactly correlated. As such, the system of Kimmitt cannot possibly satisfy the claim limitation that each scrambling (or pseudo-random) pattern is substantially de-correlated from the other scrambling (or pseudo-random) patterns at any given offset.

In light of the foregoing, it is respectfully submitted that the presently claimed invention is clearly distinguishable over the teachings of United States Patent No. 6,618,395 (Kimmitt).

Rejections under 35 U.S.C. § 103(a)

With respect, the Examiner’s rejection of claims 7 and 8 in view of Du, et al. is not understood. Claims 7 and 8 depend from claim 32, which has not been rejected as

unpatentable over the teaching of Du, et al.. Accordingly, clarification is courteously requested.

United States Patent No. 6,417,958 (Du et al) uses techniques closely similar to that of Kimmitt. Thus, “a total of N channels (for example, 100 GHz spaced WDM channels) are used to deplete a co-propagating Raman pump. The depleting tones are modulated in a Mach-Zehnder modulator 32 ... using a $2^x - 1$ pseudo-random bit stream (PRBS) sequence, with $x=7, 9$ or 31 . The bit patterns of the N depleting tones are made statistically independent (i.e., decorrelated) by time-shifting their bit patterns relative to each other, for example by using a pair of AWGR's connected with fiber delay lines having different lengths for the N individual wavelengths.” (col.7, lines 12-21)

Examination of Du et al FIG. 4 clearly shows that the same pseudo-random bit stream (PRBS) sequence is used for all of the N channels, so that decorrelation is obtained exclusively by the subsequent time-shifting step. As such, the considerations discussed above with respect to Kimmitt also apply to Du et al.

Du et al teach the use of the same PRBS sequence for each channel, while the present invention requires a “respective unique scrambling pattern”. Obviously, if the same PRBS sequence is used for every channel, they cannot possibly be unique. Time-shifting each of the channels, as taught by Du et al, does not solve this problem.

Previous claims 32 and 34, and amended claims 36 and 43, also require a limitation wherein each scrambling (or pseudo-random) pattern is substantially de-correlated from the other scrambling patterns at any given offset.” Here again, Du et al teach directly away from the present invention. In particular, Du et al teach that “the bit patterns of the N depleting tones are made statistically independent (i.e., decorrelated) by time-shifting their bit patterns relative to each other”. Since a time shift is being relied upon to provide decorrelation, it follows that, for any given pair of channels, there is at least one offset in which at the respective sequences will be exactly correlated. As such, the system of Du et al cannot possibly satisfy the claim limitation that each scrambling (or pseudo-random) pattern is substantially de-correlated from the other scrambling (or pseudo-random) patterns at any given offset.

Accordingly, it is respectfully submitted that the presently claimed invention is clearly distinguishable over the teachings of United States Patent No. 6,417,958 (Du et al).

In light of the foregoing, it is respectfully submitted that the presently claimed invention is clearly distinguishable over the teaching of the cited references, taken alone or in any combination. Thus it is believed that the present application is in condition for allowance, and early action in that respect is courteously solicited.

If any extension of time under 37 C.F.R. § 1.136 is required to obtain entry of this response, such extension is hereby respectfully requested. If there are any fees due under 37 C.F.R. §§ 1.16 or 1.17 which are not enclosed herewith, including any fees required for an extension of time under 37 C.F.R. § 1.136, please charge such fees to our Deposit Account No. 19-5113.

Respectfully submitted,
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